Validating the NOCM_UH-R

An Organizational Climate Measure for Universities and Colleges

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Preface

The present study is a part of an ongoing research project led by Professor Thomas Hoff at the University of Oslo. In an earlier part of this project, Hoff and colleagues (Hoff, 2010) developed the Norwegian Organizational Climate Measure_UH (NOCM_UH) as a means to measure organizational climate in universities and colleges. The NOCM_UH is a new and extended version of the Organizational Climate Measure (OCM) by Patterson et al. (2005). The rationale behind adding new dimensions to a valid and general climate measure is according to Hoff (2011a) to better capture challenges that are specific for the universities and colleges, in addition to capturing general challenges related to the Norwegian and international work life.

In an effort to increase the response rate at the participating organizations, Hoff and colleagues have developed a reduced version of the NOCM_UH, in this paper referred to as the NOCM_UH-R. The current research team, under the supervision of Hoff, consisted of three master students in the field of work and organizational psychology. Our part in developing the NOCM_UH were to give feedback on the new and extended dimensions, and to implement the changes made by Hoff (2010; 2011b). We translated the NOCM_UH questionnaires in to English, and were also responsible for the pilot testing of the instrument. The research team sent out the survey and collected the data. The participating institutions were promised a rapport on the results from the survey. The research team was therefore given the responsibility of writing one of the reports, and to present it to the organization.

Abstract

The present study describes the development of the Norwegian Organizational Climate Measure_UH (NOCM_UH), and the validation of the reduced version of the instrument, the NOCM_UH-R (Hoff 2010; 2011b). The NOCM_UH is a new version of the Organizational Climate Measure (OCM) by Patterson et al. (2005), and was developed in order to measure climate at universities and colleges in Norway. The study was carried out on a sample of 669 respondents from three educational institutions in Norway. Structural equation modeling was conducted to test the fit of the model. The 22 dimensions constituting the NOCM_UH-R had acceptable levels of reliability and were factorially distinct, thereby supporting the 17-latent factor structure constituting the original OCM. However, most of the new dimensions in the NOCM_UH-R were more relevant for scientific employees than administrative and technical staff. Furthermore, the survey targeted at universities had a methodological weakness, as opposed to the one targeted towards colleges, that resulted in a lack of consensual validity. This implies that the data does not qualify for aggregation to reflect a higher level construct, and that the version for universities is not measuring organizational climate in organizations, but only measure individual employee perceptions of different aspects of the work environment.

Keywords: Organizational climate, Organizational Climate Measure, Competing Values Framework, Norwegian Organizational Climate Measure for universities and colleges

Organizational climate

Organizational climate has received considerable attention and been a popular concept in the field of work and organizational psychology since the 1960's (Schneider and Reichers, 1983). Research on the topic has suggested that organizational climate is associated with important outcomes on the organizational-, workgroup and individual level. These include job satisfaction (Johnson and McIntye, 1998; Tsai and Huang, 2008), organizational productivity (Ashkanasy, Wilderom & Peterson, 2000), turnover intentions (Rousseau, 1988; Rentsch, 1990), leader behavior (Rousseau, 1988; Rentsch, 1990), and the well-being and the health of employees (Stone, Du, & Gershon, 2007).

The concept of climate has been defined and operationalized in different ways over the last decades. This paper will adopt the dominant approach of organizational climate as "*the employees` shared perceptions of organizational events, practices, and procedures*" (Patterson et al., 2005 p. 380). When climate is operationalized this way, the construct is first measured at the individual level (also referred to as psychological climate) and often by a questionnaire (Patterson et al., 2005). By aggregating the employees individual scores to the work group, department or the organization level, the mean score will represent the climate at that level (Patterson et al., 2005, p 380). The shared perception approach implies that there has to be agreement among the employees' perceptions before aggregation can take place (Anderson and West, 1998). Agreement in individual scores, also known as interrater agreement, is therefore essential before data is seen as qualified to represent the climate in organizations (Patterson et al., 2005).

Because measures of climate can be seen as an important source for information for organizations, the development of valid climate instruments is essential to the field of work and organizational psychology. Despite the extensive research and empirical studies on organizational climate, there is a lack of valid measures. According to Patterson et al (2005), there exist no valid and general climate measures, only a few valid domain-specific instruments to measure specific types of climates, like climate for service or innovation. In the lack of a general climate measure, Patterson et al. (2005) developed the multidimensional Organizational Climate Measure (OCM). Even though general climate measures are criticized for containing dimension that are not relevant for each specific study, Patterson et al. (2005) argues that a general approach is advantageous because it provides an overall view of how the whole organization operates (Patterson et al., 2005; Schneider 1975; 1990; 2000).

The OCM is a general climate measure validated in the manufacturing sector in the U.K, and the wording of the items in the questionnaire is adapted to this sector, e.g. "*The*

company is slow to respond to the needs of the customer" (Patterson et al., 2005, p. 406). Because the items in the OCM uses words like company and customer, the OCM is not an appropriate instrument to measure climate in universities and colleges. Hoff (2010) has therefore developed a new version of the OCM, the Norwegian Organizational Climate Measure for universities and colleges (NOCM_UH). The NOCM_UH is the first Norwegian climate instrument, specifically developed to measure climate in this sector (Hoff, 2011a). The NOCM_UH has a general approach to climate, but is also taking into account the specific challenges for universities and colleges, in addition to capture general challenges related to the Norwegian and international work life (Hoff, 2011a).

This paper will describe the development of the NOCM_UH, and the validation of the reduced version of the instrument, in this study referred to as the NOCM_UH-R (Hoff 2010; 2011b). Because the NOCM_UH is based on the OCM by Patterson et al. (2005), the theoretical background will first be described before the instrument and the validation of the reduced version is presented.

Theoretical background for the NOCM_UH

Organizational Climate Measure

The Organizational Climate Measure by Patterson et al. (2005) was developed as a consequence of the lack of a valid multidimensional climate measure. The climate dimensions in the OCM were collected from the extensive research literature on organizational climate from the four last decades. The final 17 dimensions constituting the instrument were extracted using confirmatory factor analysis (Patterson et al. 2005). The OCN was validated in the UK with a sample of 6869 employees across 55 manufacturing organizations. Patterson et al. (2005) found that the OCM had acceptable levels when tested for concurrent-, predictive and discriminant validity. The OCM is founded upon Quinn and Rohrbaugh`s (1981; 1983) meta-theoretical model, the Competing Values Framework (CVF).

Competing Values Framework

The Competing Values Framework emerged from different studies of the factors that played an important part in highly effective organizations (Cameron, Quinn, DeGraff and Thakor, 2006, p. 5). The framework was a response to the need of a broadly applicable model that would help organizations improve effectiveness, promote value creation, and foster successful leadership (Cameron et al., 2006). Quinn and Rohrbaugh (1981; 1983) claims that

there are four basic competing values within an organization: collaborate, create, control and compete. These values can be placed according to two different dimensions; internal versus external, and flexibility versus control. The first dimension represents a continuum ranging from internal capability and integration to an orientation towards a focus on external opportunities on the other end. The second dimension represents an orientation towards a focus on adaptability and flexibility, and the focus on consistency and stability (Cameron et al., 2006; Cameron and Quinn, 2006; Hoff, 2011a). When combining the values and dimensions this result in four quadrants representing major traditions in the study of organizational effectiveness (see Figure 1). When developing the OCM, Patterson et al. (2005) placed the 17 dimensions constituting the OCM into the respectively quadrants from the CVF, so that the dimensions reflected the models tradition.

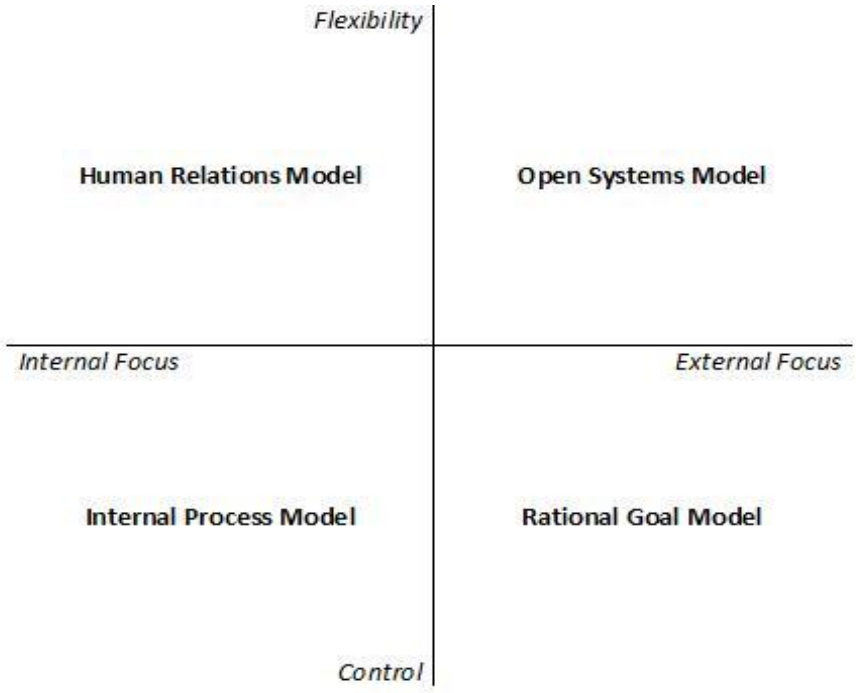


Figure 1. *An illustration of the Competing Values Framework (Quinn and Rohrbaugh, 1983)*

Development of the NOCM_UH

The NOCM_UH was developed as a means to measure organizational climate in universities and colleges in Norway (Hoff, 2010). In addition to the original 17 factors from the OCM, the instrument consists of 5 new dimensions. One of the dimensions is new, and four of the dimensions are differentiations of original dimensions from the OCM. Table 1

describes the content of the 22 dimension constituting both the NOCM_UH, and the reduced version of the instrument, the NOCM_UH-R (Hoff, 2010; Patterson et. al., 2005).

Table 1

Dimension in NOCM_UH and NOCM_UH-R

Original OCM dimensions	New or Extended Dimension	Content
Autonomy		Reflects the degree of autonomy at work
Integration	Integration Within	Reflects the degree of cooperation and communication within ones one work group
	Integration Between	Reflects the degree of cooperation and communication between work groups
Supervisory Support		Reflects the degree of employee support and understanding from nearest leader
Emphasis on training		Reflects the degree of developing employee skills
Employee welfare		Reflects the organizations care for its employees
	Team	Reflects the degree of cooperation when working in groups
Formalization		Reflects the degree of concern with formal rules and procedures
Tradition		Reflects the value of doing things in established ways
Innovation and Flexibility		Reflects the degree of accept for new ideas, innovative processes and readiness for change
Outward focus	Outward focus Teaching	Responsiveness for the student's needs
	Outward focus Research	Responsiveness for the research society's needs
	Outward focus Society	Responsiveness for the society's needs
Reflexivity		Reflects the degree of employees cognition about work processes in order to adapt to the environment
Clarity of organizational goal		Employee understanding of organizational goals
Efficiency		Employees productivity and efficiency at work
Effort		Reflects to which extend employees work hard to achieve goals
Performance feedback		The degree of feedback of job performance for employees
Pressure to produce		The degree of pressure on employees to meet targets
Quality	Quality Research	Reflects employee focus on the quality of research
	Quality Teaching	Reflects employee focus on the quality of teaching

New and extended dimension in the NOCM_UH

The new *Team* dimension seeks to measure the level of collaboration, flexibility and communication within workgroups and is therefore placed under the human relation quadrant of CVM (Hoff, 2010). The rationale behind the dimension is the focus knowledge-intensive organizations have on teamwork (Drucker, 1999). Universities and colleges are knowledge-intensive organizations. These organizations are characterized by the fact that the work is not routine-based, difficult to standardize and with a focus on teamwork (Alvesson, 2001; Drucker, 1999). Most employees have higher education and the focus is on knowledge production, rather than material production. Continuing innovation is a part of the work and productivity is not only measured in quantity and output, but also in quality (Alvesson, 2001; Drucker, 1999). In addition, a recent study investigating the relevance of the OCM for university employees found through interviews that only 50 % of the respondent's statements could be explained by the 17 dimensions in the OCM (Hønsen, 2010). A closer investigation of the 50 % residual data revealed statements about intragroup behavior (Hønsen, 2010). Intragroup behavior may therefore be a relevant topic among employees at universities and colleges.

The original OCM dimension *Integration* seeks to measure the degree of interdepartmental trust, cooperation and communication in organization (Patterson et al., 2005). Universities and colleges have two distinct categories of staff, namely scientific employees and administrative/ technical employees (Mintzberg, 1989). This makes it relevant to measure the degree of integration within one's own job category (i.e. scientific or administrative/ technical employees), and also to measure the integration between the different job categories (i.e. scientific and administrative/ technical employees). Because of the distinction between categories of staff, the OCM dimension *Integration* is split in two dimensions referred to as *Integration Within* and *Integration Between*.

The original OCM dimension *Outward focus* measures the company's degree of responsiveness to the customers' needs and the marketplace in general (Patterson et al., 2005). In NOCM_UH, this dimension is split in three. The rationale behind this split is based on the purpose of educational institutions as their main tasks are to teach students, to do research, and to publish their research findings (Hoff, 2010; Universitets- og Høyskoleloven, 2005). The new dimensions *Outward focus Teaching*, *Outward focus Research* and *Outward focus Society* therefore seeks to reflect the institutions degree of responsiveness for the student's needs, the needs of the research society and the society's needs in general.

The original OCM dimension *Quality* measures the degree of emphasis given to quality procedures (Patterson et al., 2005). Some of the main tasks for employees in universities and colleges are to do research and to teach students. This is the rationale behind the split of the original OCM dimension *Quality* in two. The new dimensions labeled *Quality Research* and *Quality Teaching* therefore seeks to capture employees' views on both research and teaching quality.

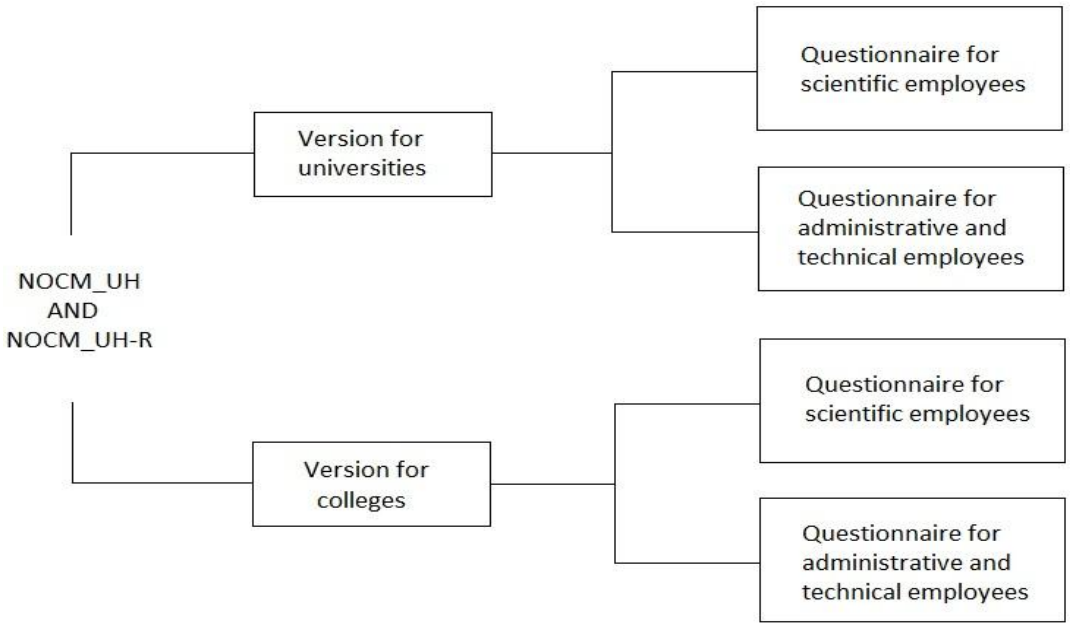
Structure of the NOCM_UH

The NOCM_UH consists of four questionnaires, as seen in Figure 2. The different questionnaires only intend to differ with regards to contextual aspects and not the content being measured. One of the versions are targeted at universities and another towards colleges. The two versions were developed because universities and colleges have different names on their units and employees (Hoff, 2010). To prevent a methodological weakness related to poorly descriptive items, the climate items were specifically adapted to each organization, e.g. "*The research unit is suspicious of employees at the administrative unit*" (college version) compared to "*The researchers are suspicious of the technical/ administrative department employees*" (university version). The NOCM_UH is further differentiated to measures climate among scientific employees or among administrative/ technical employees. The rationale behind the split is related to the different tasks and functions employees have in universities and colleges (Hoff, 2010). The administrative/ technical employees' main task in universities and colleges is to facilitate the work of the scientific employees, and their work can be seen as separated from the work of the scientific employees (Hoff 2010; Mintzberg, 1989). Because of the clear distinction between the groups of employees, it is likely that the groups will develop their own organizational climate. Shared perceptions among a group are essential before aggregation of individual perceptions to reflect a higher construct can take place (Anderson and West 1998; Hoff 2010; Patterson et al., 2005).

NOCM_UH-R

The NOCM_UH have extensive questionnaires with 106-108 items reflecting 22 dimensions. Extensive surveys may result in low response rates and Hoff (2011b) has in an effort to increase the response rate developed a reduced version of the instrument, the NOCM_UH-R. Hoff (2011b) removed items from each dimension in the NOCM_UH to develop the NOCM_UH-R. The reduced version of the instrument has the same dimensions

and the structure as the NOCM_UH, but only differs with regards to the number of items reflecting each dimension.



Figur 2. *The structure of the NOCM_UH and NOCM_UH-R*

The purpose of the study

The purpose of the study is to test the validity of the NOCM_UH-R. If support for the reduced version of the instrument is found, this will imply that the new and extended dimensions can be seen as factorially distinct. Such a result will further indicate that all 22-latent factors are distinct, thereby supporting the 17-latent factor structure constituting the original OCM.

The Norwegian Organizational Climate Measure (NOCM) is a translation of the OCM and was validated with 555 participants from the Norwegian service sector. Bernstrøm (2009) found support for the Norwegian translation and the 17 factor structure constituting the NOCM. The NOCM_UH was also recently validated in a study with 470 participants from three universities and colleges in Norway (Nordgård, 2011). Nordgård (2011) found support for the 22 dimensions constituting the NOCM_UH. Combining the results from the validation of the NOCM and the NOCM_UH, it is expected that:

Hypothesis 1a: Confirmatory factor analysis will support the 22-latent factor structure constituting the NOCM_UH-R

The two versions targeted at scientific employees and administrative/ technical employees intended to only differ with regard to the contextual aspects, and not to the content being measured. The 22-latent factor structure of NOCM_UH-R should therefore remain the same when testing the model fit for both questionnaires and it is expected that:

Hypothesis 1b: Confirmatory factor analysis will support the 22-latent factor structure constituting the NOCM_UH-R across the questionnaires for scientific and administrative/ technical employees

Patterson et al. (2005) claims that the OCM is a valid and general measure, but has only been tested in the UK and once in the service sector in Norway (Bernstrøm, 2009; Patterson et al., 2005). As a general measure of organizational climate, the instrument will increase its generalizability when supported in other sectors. Because the factor structure of the OCM has been supported in previous research (Bernstrøm 2009; Nordgård, 2010; Patterson et al., 2005) it is expected that:

Hypothesis 2: Confirmatory factor analysis will support the 17-latent factor structure constituting the OCM

There is a distinction between scientific and administrative/ technical employees with regards to the tasks and functions they have in the educational institutions (Hoff 2010; Mintzberg 1989). Because of this distinction, the new dimensions *Team*, *Outward focus Teaching*, *Outward focus Research*, *Outward focus Society*, *Quality Teaching* and *Quality Research* may therefore be more relevant for the scientific employees as their work are related to these dimensions. It is therefore expected that:

Hypothesis 3: The administrative/technical respondent answering the NOCM_UH-R, will choose the response alternative "*not relevant for me*" on the new and extended dimensions more often than the scientific employees

The NOCM_UH and NOCM_UH-R have a methodological weakness regarding the descriptive level being measured. According to Patterson et al. (2005) "*Each climate questionnaire item should clearly focus on the specific collective unit which corresponds to the climate being studied (team, department or organization*)" (Patterson et al., 2005, p. 383).

The NOCM_UH questionnaires have items that are both worded general e.g. "*It is considered extremely important here to follow the rules*", and items that are worded specific e.g. "*The technical/administrative unit is very inward looking; it does not concern itself with what happens in society in general* ". The problem arises when the intention of the questionnaires is to either measure the climate among the scientific employees, or among the administrative/ technical employees. The reason for this is that in universities, both the scientific and the administrative/ technical employees work within the same unit, labeled institute. So when an administrative/ technical employee in a university answers a general question e.g. "*It is considered extremely important here to follow the rules*", it is not clear whether the employee answer according to his/her affiliation to the institute, or to the sub-group (i.e. administrative/ technical group). This problem is further complicated by the fact that respondents from the universities in the e-mail invitation are asked to give their responses based on their affiliation to the nearest institute. Regarding the questionnaires for the college employees, this is not so much of a problem because the scientific and the administrative/ technical employees work in separate units. Because of this, the employees at colleges give their answers based on their affiliation to a department (i.e. scientific or administrative department) who also is their subgroup (i.e. scientific or administrative group). Figure 3 provides a simple illustration of the organizing of universities and colleges.

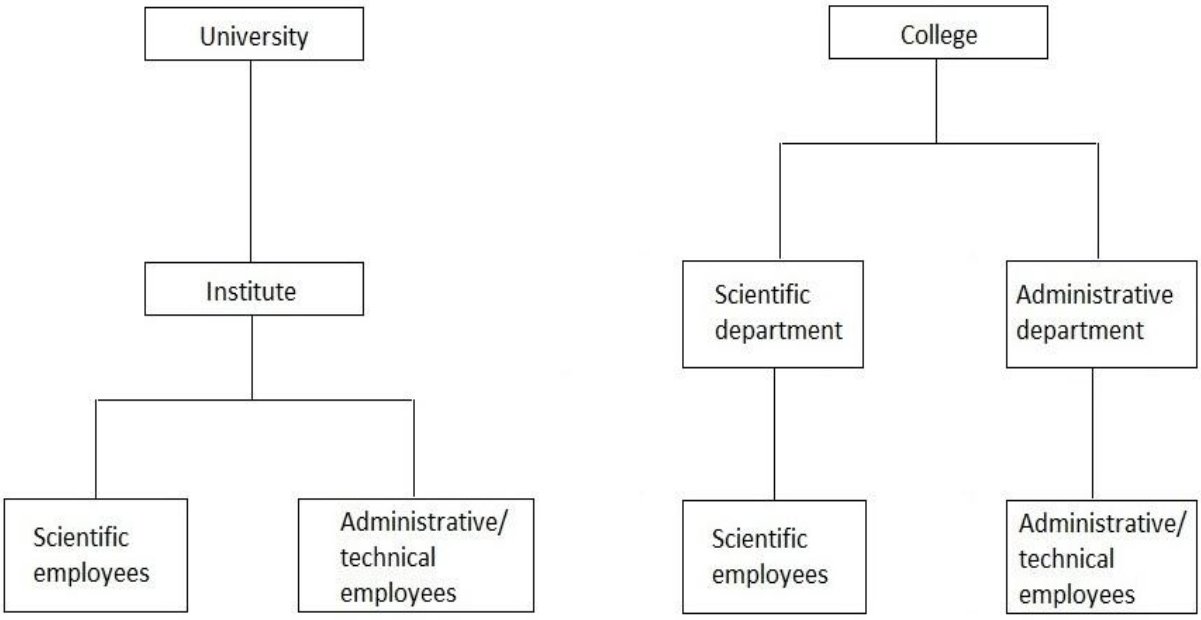


Figure 3. *An illustration of the organizing of universities and colleges*

Because of the methodological weakness in the NOCM_UH-R questionnaires it is expected that:

Hypothesis 4: The study will not be able to establish consensual validity, as it will not find agreement in the ratings from the scientific employees or the administrative/ technical employees

Method

Respondents

The NOCM_UH-R was sent to 352 employees working in one university in Norway and 221 participants completed the survey. Because the present study is part of an ongoing research project, data from two previous full length NOCM_UH surveys were available. In these surveys, 448 participants from two colleges had completed the questionnaires. In order to increase respondents, the data from the two full length NOCM_UH surveys were included. This was possible because the NOCM_UH-R is made up by items from the full length NOCM_UH. The participants answering the full length survey had therefore given their responses on the same items as the participant answering the reduced version. It was the NOCM_UH participant's responses (N=448) on the *identical* items that were included in the dataset. The increased dataset consisted of 669 respondents from one university and two colleges in Norway. Participants were scientific-, administrative and technical staff working in different levels in the organizations. Data collection took place between November 4, 2010 and April 13, 2011.

Questionnaires

Hoff (2011b) removed items from each dimension in the NOCM_UH to develop the NOCM_UH-R. The NOCM_UH-R questionnaires consist of 66 items to reflecting 22 dimensions and with 3 items in each dimension. Hoff (2011b) selected the items in the NOCM_UH-R by extracting the 3 items with the highest factor loadings from the 17 dimensions in the NOCM (Bernstrøm, 2009). The procedure was then generalized to the new dimensions *Integration Within, Integration Between, Outward focus Research, Outward focus Teaching, Quality Research* and *Quality Teaching*. On the new *Team* dimension, Hoff (2011b) conducted a reliability analysis, keeping the 3 items showing the highest reliability.

The response format for the NOCM_UH-R was a 5- point Likert scale with the options *agree, agree a bit, disagree a bit, disagree* and *not relevant for me*. The NOCM_UH

participants had the same response alternatives on the Likert scale, except for the option *not relevant for me*. Even though it might lead to response bias, the items in the surveys were not randomized. When the items are presented according to the scale they belong to, the questionnaire is presented more similar to the way it is expected to be used in later studies (Patterson et al., 2005).

Preparation

The NOCM_UH and the NOCM_UH-R are Norwegian surveys. As a basis to extend the OCM, Hoff (2010) therefore used the items from the Norwegian translation of the OCM, the NOCM (Bernstrøm, 2009; Hoff, 2010). The wordings of some of the items from the NOCM were changed and new items develop as a consequence of a) developing the new *Team* dimensions b) the extension of the OCM dimensions *Integration, Outward focus* and *Quality* c) adapting the survey to *universities* and *colleges* and d) adapting the survey to *scientific* and *administrative/ technical* staff (Hoff, 2010). Because educational institutions have multicultural employees, the respondents could answer in either Norwegian or English. The English questionnaires were a translation of the NOCM_UH questionnaires, and based as far as possible on the wording of the original items in the OCM.

A Think Aloud pilot test with both scientific and administrative employees from a university was conducted before the final questionnaires were sent out. This was done to identify the items that respondents found confusing or vague (Patterson et al., 2005). The pilot test revealed that most respondents were confused about which level in the organization they should answer according to. This resulted in that most items in the questionnaires were specified with the word “here” in an effort to reflect that the respondents should answer according to their nearest institute or department. Appendix A and B shows the items in the NOCM_UH-R questionnaires targeted at scientific and administrative/ technical employees in colleges.

Procedure

Before the NOCM_UH and the NOCM_UH-R surveys were sent out, the employees from the three institutions received an e-mail from the management that encouraged them to participate. The management was in return for their participation promised a report on the results (Hoff 2010; 2011). The e-mail addresses to the employees were provided by the educational institutions and the lists had some errors that were removed. There might be that some of the remaining e-mail addresses were not in use, and therefore affected the response

rate. The survey was administered to the respondents through the online survey tool *Questback*. The participants from both the NOCM_UH-R and the NOCM_UH were given the same information in the e-mail invitation. They were asked to give an evaluation of their workplace, and they were told that the questionnaire would take approximately 15 minutes to complete. Included in the e-mail invitation was information about voluntary consent. The respondents were told that the data would be handled anonymously and not linked back to them personally. Participants were encouraged to submit their responses based on how they perceived the climate within the department or institute, rather than to generalize to the individual, faculty or organizational level. The surveys were available online for the respondents for approximately two and a half week. Depending on which educational institution they worked in, the employees received two or three e-mail reminders that encouraged them to participate.

Statistical analysis

PASW Statistics 18 and Amos 18 were the statistic programs used in the study to describe and test the relationships in the data. The following procedures were performed to test the hypotheses a) structural equation modeling (SEM) b) correlation analysis c) missing values analysis d) reliability analysis of the scales and e) calculation of rWG(j) index to represent the degree of interrater agreement (James, Demaree and Wolf, 1984). Because of missing values and the underlying theory about the direction of the items and the latent factors, only confirmatory and not exploratory factor analysis was conducted on the data. SEM analyses were the preferred method because SEM tests how well the predicated model fits the data, and it also allows one to compare alternative models (Pallant, 2010).

Results

Descriptive statistics

The mean response rate for the three institutions completing the NOCM_UH and NOCM_UH-R surveys were 60 % (N=669). The response rate ranged from 58% to 63 % across the institutions and this is high, as the mean for other organizational studies is 35, 7 % (Baruch and Holtom, 2008). 17 % (N=113) of the respondents were university employees and 83 % (N=556) were college employees. 65, 6 % of the respondents were scientific employees (N=439), while 34, 4 % (N=230) were technical/ administrative employees.

An independent-samples t-test was conducted to control for response biases between respondents answering before or after the last e-mail reminder. The analyses showed no

significant difference between the respondents answering before or after the last e-mail reminder for any of the 22 dimensions, $p < .01$ (two-tailed).

The response alternative "*not relevant for me*" was coded as a missing value in the analyses and only the 221 respondents answering the NOCM_UH-R were given this response option. When N=669, the percent missing for each question ranged from 0 - 7, 6 %. Little's MCAR test showed that the data was not Missing Completely at Random (Schafer and Graham, 2002). Because a list-wise deletion would result in the loss of respondents, Expectation-maximization algorithm (EM) was used to replace missing data in all analyses including SEM (Dempster, Laird, & Rubin, 1977; Patterson et al., 2005). Because EM uses the information contained in cases with and without missing data to compute a maximum likelihood covariance matrix, the algorithm makes more efficient use of the available data than standard missing data techniques (Patterson et al., 2005, p. 388).

Some of the dimensions in the data set were not normally distributed and this is quite common in the field of social science (Pallant, 2010). A visual inspection of the boxplot for these dimensions showed that the dimensions had outliers, meaning that they had cases with values well above or well below the majority of cases (Pallant, 2010, p. 64). An inspection of the outliers' responses in the data file showed no typing error. The outliers were not removed as the mean value and the 5% trimmed mean value for these dimensions were almost the same. In combination with a large sample size, this indicates the outliers will most likely not be problem when performing statistical analyses on the data (Pallant, 2010).

Confirmatory Factor Analysis

SEM analyses were conducted to test the fit of the models. Assessment of fit essentially calculates how similar the predicted model is to the matrices containing the relationships in the actual data (Pallant, 2010). Three indices are reported in this paper, the Non- normal fit index (NNFI) also known as the Tucker Lewis index, Comparative fit index (CFI) and the Root mean squared error of approximation (RMSEA). A combination of these indices seeks to cover the lack of one ideally fit index, because different fit indices is sensitive to sample size, model size, model misspecification and model types (Fan and Sivo, 2007). Because the model fits are a function of the chi-square and the degrees of freedom, these are also reported (Curran, Bollen, Chen, Paxton & Kirby, 2003).

Hypothesis 1a. The first hypothesis stated that confirmatory factor analysis would support the 22-latent factor structure constituting the NOCM_UH-R. The NNFI (Tucker Lewis index) and the CFI should all have values above 0.90 to be considered good fit (Hu and

Bentler, 1999). For the RMSEA, a value below 0.08 is acceptable, but a value below 0.05 is considered to be a good fit (McDonald and Ho, 2002). As seen in Table 2, all indices met the acceptable level of fit, thereby supporting the hypothesis.

Table 2

Goodness of fit indices for the 22-factor model

Index	All employees
NNFI	.91
CFI	.92
RMSEA	0.039 LO90: 0.039 HI90:0.041
Chi-square (d.f.)	3701,699 (1848)

N=669

Hypothesis 1b. Regarding the second hypothesis, that confirmatory factor analysis would support the 22-latent factor structure constituting the NOCM_UH-R across scientific- and administrative/technical employees, the indices were more contradictory. As seen in Table 3, the RMSEA for both group were stable and indicating good fit with a value of 0.04. But only the CFI for the scientific employees were at the acceptable level with a value of 0.90. As argued by Patterson et al. (2005), achieving high levels of fit with large numbers of items is difficult (Floyd and Widaman, 1995). When items are specified to load on to just one factor as in the NOCM_UH-R, this also limits the chance of finding acceptable indices (Patterson et al. 2005). All though some of the fit indices were slightly below the recommended level, the indices were similar to previous research validating the OCM, NOCM and NOCM_UH (Bernstrøm, 2009; Nordgård, 2011; Patterson et al., 2005).

Table 3

Goodness of fit indices for the 22-factor model across employees

Index	Scientific employees	Admin/tech. employees
NNFI	.88	.86
CFI	.90	.88
RMSEA	0.045 LO90: 0.043 HI90: 0.048	0.049 LO90: 0.046 HI90: 0.053
Chi-square (d.f.)	3516,524 (1848)	2867,844 (1848)

N = 439/230

Hypothesis 2. Patterson et al. (2005) argues that the OCM is a valid climate measure and the instrument has already been supported in other countries and sectors (Bernstrøm 2009, Nordgård 2011). In Hypothesis 2 it was expected that confirmatory factor analysis would support the 17-latent factor structure constituting the OCM. To test the hypothesis, the 22 dimensions constituting the NOCM_UH-R were reduced to 17 to reflect the same dimensions as in the original OCM. Excluded from the analysis were the dimensions *Team, Integration Between, Outward focus Research, Outward focus Teaching* and *Quality Teaching*. The dimensions *Integration Within, Outward focus Society* and *Quality Research* was kept in the analysis as the content of these dimensions were more similar to the content of the original OCM dimension *Integration, Outward focus* and *Quality*. As seen in Table 4, the hypothesis is supported with a NNFI and a CFI value above 0.90, in combination with a low and stable RMSEA at the level of 0.03.

Table 4

Goodness of fit indices for the 17-factor model

Index	All employees
NNFI	.93
CFI	.94
RMSEA	0.038 (LO90: 0.035 HI90: 0.040)
Chi-square (d.f.)	2115,870 (1088)

N=669

Missing values analysis

The response option "*not relevant for me*" was in the dataset coded as a missing value. In Hypothesis 3, it was stated that descriptive statistics would show that the administrative/ technical respondent answering the NOCM_UH-R chose the response option "*not relevant for me*" on the new dimensions more often than the scientific employees. In Table 5, items with more than 7 % missing values are presented. The administrative/ technical employees chose the "*not relevant for me*" option more often regarding the dimensions *Integration Between, Team, Outward focus Research, Quality Research* and *Quality Teaching*. The same results were not found regarding the dimension *Integration Within, Outward focus Teaching* and *Outward focus Society.*

Table 5

Missing values analysis

Question	Item	Total %	Scientific %	Admin/ Tech %
Q7	Integration Between	10.9	7.9	16
Q8	Integration Between	7.7	8.6	6.2
Q9	Integration Between	7.2	8,6	4,9
Q22	Team	15.8	13.6	19.8
Q23	Team	16.7	15	19.8
Q24	Team	23.1	20	28.4
Q37	Outward focus Research	9.5	3.6	19.8
Q38	Outward focus Research	14.5	5.7	29.6
Q39	Outward focus Research	17.6	7.9	34.6
Q61	Quality Research	16.7	10	28.4
Q62	Quality Research	14.9	8.6	25.9
Q63	Quality Research	18.1	7.1	37
Q64	Quality Teaching	13.1	0.7	34.6
Q65	Quality Teaching	10.4	10.4	28.4

N = 221. Only items with 7 % missing values or more are presented

Consensual validity

Hypothesis 4 stated that the study would not be able to establish consensual validity as it would not find agreement in the ratings from the scientific employees or the administrative/ technical employees. To test the hypothesis, interrater agreement (IRA) was estimated using the within-group agreement index of multiple items scales, also known as the rWG(j) index (James et al., 1984). rWG(j) values at or above 0.70 are considered acceptable levels of IRA (LeBreton and Senter, 2007). As presented in Table 6, the results show low levels of within-group agreement on most dimensions for both the scientific employees and the administrative/ technical employees. Only 9 of the 22 scales for the scientific employees were at or above the acceptable value of 0.70. For the administrative/ technical employees, only 13 of the 22 scales were at or above the acceptable value 0.70.

Additional support

The scales internal consistency was estimated using one of the most common indicators, the Cronbach's alpha coefficient (DeVellis, 2003; Pallant, 2010). As seen in Table

6, all values were at or above 0.70, except the *Integration Between* scale (α = .68). Although values above 0.8 are preferable, values above 0.70 are acceptable (DeVellis, 2003). According to the results, the dimensions in NOCM_UH-R have good internal consistency.

Table 6

Reliability and interrater agreement of scales

CVF quadrant	Scales		Cronbach's Alpha	rWG(j) Scient.	rWG(j) Admin/tech.
HR	1	Autonomy	0.70	0.70	0.68
HR	2	Integration Within	0.70	0.62	0.58
HR	3	Integration Between	0.68	0.84	0.81
HR	4	Involvement	0.84	0.57	0.64
HR	5	Supervisory Support	0.85	0.78	0.73
HR	6	Training	0.86	0.45	0.84
HR	7	Welfare	0.89	0.67	0.70
HR	8	Team	0.87	0.72	0.97
IP	9	Formalization	0.76	0.76	0.70
IP	10	Tradition	0.70	0.74	1.16
OS	11	Innovation and flexibility	0.84	0.76	0.62
OS	12	Outwards focus Teaching	0.75	0.67	0.63
OS	13	Outwards focus Research	0.84	0.61	1.38
OS	14	Outwards focus Society	0.88	0.68	1.12
OS	15	Reflexivity	0.77	0.61	1.38
RG	16	Clarity of org. Goals	0.87	0.64	0.63
RG	17	Efficiency	0.77	0.66	0.56
RG	18	Effort	0.83	0.84	0.81
RG	19	Performance Feedback	0.79	0.56	0.44
RG	20	Pressure to produce	0.80	0.64	1.84
RG	21	Quality Research	0.83	0.62	0.76
RG	22	Quality Teaching	0.84	0.71	0.85

CVF quadrant; HR= Human Relations model, IP= Internal Process model, OS= Open Systems model, RG= Rational Goal model

As expected when dealing with aspects of climate, the correlation matrix shows that climate dimensions correlates with each other but none of the correlations were above 0.80 (Patterson et al., 2005). Appendix C shows the means, standard deviations and the correlation matrix for the 22 scales constituting the NOCM_UH-R.

The high factor loading between the dimensions and the items with most items having loadings above 0.70 is additional support for the model. Appendix D presents the standard regression weights for all items.

Discussion

The purpose of the study was to describe the development of the NOCM_UH and to validate the reduced version of the instrument, the NOCM_UH-R. If support for the reduced version of the instrument was established, then the 22 dimension constituting the NOCM_UH-R could be seen as factorially distinct. If the original 17- latent factor structure of the OCM also was supported, it could be seen as additional support for the generalizability of the original instrument. Another assumption made in the study was that administrative/ technical employees had chosen the response option "*not relevant for me*" on the new and extended dimensions more often than scientific employees, supporting that these dimensions were more relevant for the last group. Further, if the study was not able to establish interrater agreement in the scores from the employees, this could be seen as support for that the data did not qualify for aggregation to reflect the organizational climate in the institutions.

Hoff (2011b) removed items from each dimension in the NOCM_UH to develop the NOCM_UH-R. When items in a survey are reduced, the instruments ability to measure the dimensions properly may be wakened even though a reduced version may increase response rate. The reduced version of the NOCM_UH-R had the highest response rate (63 %) as opposed to the NOCM_UH version. All though the organizations were told that the questionnaire would take approximately 15 minutes to accomplish, feedbacks from respondents who had actually answered the full length NOCM_UH version reported that it could take up to 40 minutes to finish. Talk among colleagues about the extensive questionnaire may have contributed to that the response rate for the full length version were lower than the reduced version. An additional benefit of using a reduced version is that the organizations can add a few specific questions of their own without exceeding the response time for the questionnaire with more than a couple of minutes.

Hypothesis 1a and 1b

Fit indices are sensitive to sample size, model types, model size and model misspecification. This makes it difficult to establish a final cut-off criteria, although values at or above 0.9 are the recommended level (Fan and Sivo 2007). The NNFI and the CFI are both sensitive to model types and to model misspecifications (Fan and Sivo 2007). Because of the limitations of fit indices, Blunch (2008) has argued that a model with a low RMSEA only needs a CFI above 0.8 to be regarded as a good model.

Regarding Hypothesis 1a, the hypothesis is supported with a NNFI and a CFI value above 0.90, combined with a RMSEA value of 0.03. Regarding hypothesis 1b, some of the indices were slightly below the recommended level of 0.90. But if one accepts that a low RMSEA only need a CFI above 0.8 to be considered a good fit, the 22-latent factor structure constituting the version for scientific employees was supported (Blunch, 2008). For the administrative/ technical employees, only the RMSEA was stable and at the acceptable level of 0.04. The results are complicated by the fact that the RMSEA rewards simpler models as in the NOCM_UH-R, where items are specified to load on to just one factor. In addition, the RMSEA rewards larger models with many items as the NOCM_UH_R, meaning that the RMSEA decreases, when the number of variables increases (Fan and Sivo 2007; Kenny and McCoach, 2003). Because the RMSEA value for all the models were well below the acceptable level of 0.08 and because it is widely accepted that it is difficult to achieve high levels of fit with a large number of items (Patterson et al., 2005; Floyd and Widaman 1995), this give support to Hypothesis 1b. The model fits for the scientific and the administrative/ technical employees were also similar to previous research, who accepted the latent factor structure constituting the instruments (Bernstrøm 2009; Nordgård, 2010; Patterson et al., 2005). In line with the arguments above, Hypothesis 1a and 1b is therefore accepted. This implies that the 22 dimensions constituting the NOCM_UH-R are factorially distinct, and that the new and extended dimensions in the NOCM_UH-R are adding additional information to the OCM. In addition, since the fit indices across the different job types (i.e. scientific and administrative/ technical staff) were almost the same, the generalizability of the NOCM_UH-R is supported as it shows that the factor structure holds for each population (Patterson et al., 2005).

Hypothesis 2

The 22 dimension constituting the NOCM_UH-R were reduced to reflect the 17 dimension in the original OCM. Even though the items in the two surveys are different, the

dimensions are expected to measure the same content. The model fit for the 17-latent factor structure constituting the original OCM had acceptable indices (above 0.90) as presented in Table 4. Because the RMSEA value (0.03) was stable and well below the acceptable level of 0.08, Hypothesis 2 is supported. This gives additional support for the generalizability of the OCM, meaning that the instrument can be used to measure climate in other countries and in other areas of investigation.

Hypothesis 3

The main job for scientific employees in universities and colleges are to teach student and to do research, and this work may be done in collaboration (team) with other colleagues. The new dimensions *Integration, Team, Outward focus* and Q*uality* might therefore be more relevant for the scientific employees. This assumption was also supported by the missing values analysis as the administrative/ technical employees had chosen the option "*not relevant for me*" on most of these dimensions. Although Hypothesis 1b was supported, the poorer model fit for the administrative/ technical employees on the NOCM_UH-R can be seen as additional support for Hypothesis 3. The result from the missing values analysis in combination with a poorer model fit may therefore imply that the new dimensions in NOCM_UH-R are more relevant for the scientific employees.

Hypothesis 4

The study was not able to find interrater agreement in the scores from the scientific or the administrative/ technical employees, and this supports Hypothesis 4. As argued before, the reason for this might be that the university employees gave their responses according to different levels within the organization. If this reason is accepted, the dimensions that had items reflecting a specific level should yield higher rWG(j) values. The specific items for both groups were in the dimensions *Integration Within* and *Integration Between.* As seen in Table 5, none of the groups had acceptable values at or above 0.70 regarding the *Integration Within* scale. Regarding the *Integration* B*etween* scale, both groups had acceptable values. The administrative/ technical employee's items regarding the dimensions *Outward focus Research, Outward focus Society, Quality Research* and *Quality Teaching* were also specified in the questionnaire. The administrative/ technical employees had acceptable rWG(j) values on all of these dimensions thereby supporting the hypothesis. Another reason related to the lack of interrater agreement is that there exist different subgroups among the employees and the respondents gave their answers based on their affiliation to such a subgroup. The different

subgroups may exist inside or across the scientific- and the administrative/ technical employees. Because the rWG(j) index uses a uniform null distribution, it predicts that there is one true score for all groups (LeBreton and Senter, 2007). But if one allowed a score to have multiple true scores using the rWGp (one for each subgroup), the subgroups must be identified a priori or else the results would be completely at random (LeBreton and Senter, 2007). Because of the size and the diversity of today's organizations, finding interrater agreement among employees may be almost impossible when measuring large groups. The reason for this is that when employees are working close together they will most likely develop their own climate (Anderson and West 1998). According to Anderson and West (1998), interrater agreement should therefore be measured at the level of the work group or subunit, instead of at the organizational level. In the NOCM_UH and NOCM_UH-R, climate is measured in two large groups of staff, namely the scientific or the administrative/ technical group. The size of the two groups of employees may have been too large to find interrater agreement and contributed to that the study was not able to establish consensual validity. Because of the argumentation above about the methodological weakness in the NOCM_UH-R version for universities, Hypothesis 4 is accepted. This implies that the NOCM_UH-R questionnaires for universities is not measuring organizational climate in organization, but only measures individual employee perception of different aspects of the work environment (Patterson et al., 2005).

Limitations

The study only tested two models on the data even though other models might yield the same or better fits. Regardless of this and because of the underlying theoretical assumption about which items that loads on to which factor, the results give a good explanation of the relationships in the data.

The NOCM_UH-R only had three items to measure each factor, as opposed to the NOCM_UH that had 5-7 items. Fewer items may have weakened the instruments ability to adequately measure the content of the dimensions and another solution to increase the response rate would be to only use the dimensions relevant for each study, keeping the items but reducing the dimension.

The items in NOCM_UH-R are based on the NOCM (Bernstrøm 2009). If the translation and back translation of the NOCM included errors, these may have been transferred to the NOCM_UH-R questionnaires and resulted in that the respondents misinterpreted the questions as they were intended to by Patterson et al. (2005). There is still

no reason to believe that the items in NOCM had errors as the results from the validation study were similar to those of Patterson et al. (2005). Before sending out the NOCM_UH-R, a pilot test was also conducted to prevent that the questionnaires contained items that the respondents found confusing or ambiguous.

An assumption made in this study was that the responses from the scientific and the administrative/ technical employees reflected the same dimension, even though some of the items for the two groups were slightly different. If the items in the questionnaires differed with regards to the content and not just the context as intended, the respondents may have answered different items. This may have affected the results from the confirmatory factor analysis, but this is unlikely as most of the fit indices were acceptable.

Another assumption made in the study is that the answers from the 448 respondents from the full length version of the NOCM_UH were not affected by the items excluded from the reduced version. If their answers were biased, it may have affected the results and hence conclusions about construct validity are not possible.

The Likert scale in the study was a 4- point, meaning that the scale did not include a mid-point. The lack of a mid-point on a scale can reduce social desirability bias as when respondents choose the neutral option on the scale because they want to please or be helpful to the researcher, or not give socially unacceptable answers (Garland 1991). On the other hand, to force respondents to make statements on subjects they might not agree on may result in that the variation within the sample is artificially high (Garland 1991). The benefit of having an *alternative* option in the Likert scale can seen in results from the missing values analysis. Because one third of the sample (N = 221) was given the response option "*not relevant for me*" (even though it is not a neutral response option), such an option revealed the items that the employees did not find relevant.

As discussed earlier, the NOCM_UH-R versions for the university employee had a methodological weakness that resulted in the lack of consensual validity. The weakness was not intentional, but nevertheless it may have affected that the study were not able to establish consensual validity.

Further research

More research needs to be done to validate the reduced version of the NOCM_UH as only 221 of the respondents actually answered this version. Further research on the instrument should try to specify all items to reflect the same level within the organization, thereby enabling the instrument to establish consensual validity. As the pilot study also revealed, most

respondents were uncertain about which level in the organization they should answer according to.

The NOCM_UH and NOCM_UH-R questionnaires exist in English versions in addition to the Norwegian versions. Even though the English versions were based as far as possible on the items from the original OCM, the items did not include proper translations and back translations. Further development may therefore want to validate the English versions of the instruments.

The items in the original OCM were specifically selected to represent the dimensions of investigation, and so were the items in the new and extended dimensions in NOCM_UH (Hoff 2010; Patterson et al., 2005). As this implies that the scales have high face validity, further research may wish to investigate whether other items may yield higher scale reliability and better model fits.

Regarding the relevance of the OCM, the dimensions in the instrument have a clear theoretical basis as most of them were gathered from extensive literature on organizational climate from the four last decades. Because the dimensions can be mapped into the four quadrants of CVM, they also represent four major traditions in the study of organizational effectiveness. But as work life has progressed, more people are now working in the service sector than in the traditionally industry. This may imply that the OCM is not taking into account the shifting aspects of the new work life (Alvesson, 2001; Torp, 2005). Patterson et al. (2005) also pointed to the lack of the instruments ability to measures the organizations emphasis on ethical practice and policy. Further research may therefore want to investigate whether other dimensions are relevant and more related to the new work life.

Conclusion

Most dimensions in the NOCM_UH-R have a clear theoretical basis. This is because the instrument is based on the OCM by Patterson et al (2005), who collected the latent factors from the extensive literature on organizational climate from the four last decades. Because the dimensions can be mapped into one of the four quadrants of Competing Values Framework (Quinn and Rohrbaugh 1981; 1983), they also represent four major traditions in the study of organizational effectiveness.

The study found support of the 22-latent factor structure constituting the NOCM_UH-R (Hoff, 2011b). This indicates that the new and extended dimensions are factorially distinct and provides the original OCM with additional information, relevant for universities and colleges. The same result was also found across the scientific and the administrative/ technical

employees, as the instrument separates these two groups because of the different functions they have in universities and colleges. The study found support of the 17- latent factor structure constituting the OCM, and this can be seen as additional support for the generalizability of the OCM. The result implies that the OCM can be used to measure organizational climate in other countries and in other sectors than in the industry sector in the UK, where it was first validated.

The missing values analysis showed that the administrative/ technical employees had chosen the response option "not relevant for me" more often regarding the new dimensions *Integration Between, Team, Outward focus Research, Quality Research* and *Quality Teaching*. Since most work of the scientific employees is related to teaching and research, the results from the analyses supports that the content of the new dimensions are more relevant for this group.

The study was not able to establish consensual validity. The reason for this may be that the NOCM_UH-R has a methodological weakness related to the descriptive level being measured. Because universities and colleges are organized differently, the weakness is especially relevant for the version targeted at universities as opposed to the one targeted towards colleges The findings may imply the NOCM_UH-R questionnaire for the university employees is not measuring organizational climate in the organization, but only measures individual employee perception of different aspects of the work environment (Patterson et al., 2005),

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Appendix A: NOCM_UH-R questionnaire. Distributed to scientific employees.

Reversed items are marked with an asterix (*) and were reversed before all analyses were conducted.

Autonomi (Autonomy)

Q 1 Lederne her lar stort sett ansatte ta sine egne beslutninger
Q2 Lederne her har tillit til at man kan ta arbeidsrelaterte beslutninger uten å innhente tillatelse først
Q3 Lederne her har et strengt regime over måten ting blir gjort på *

Integrasjon mellom vitenskapelige ansatte (Integration among scientific employees)

Q4 Det er lite konflikt mellom forsker- eller faggruppene her
Q5 De ansatte er innstilt på å dele informasjon på tvers av forsker- eller faggrupper her
Q6 Det er lite respekt mellom forsker- eller faggruppene her *

Integrasjon mellom vitenskapelig- og administrativit/teknisk ansatte (Integration between scientific and administrativ/technical employees)

Q7 Det er lite konflikt mellom forsker- eller faggruppene og administrasjonsavdelingen
Q8 De ansatte er innstilt på å dele informasjon på tvers av faglige avdelinger og administrasjonsavdelingen
Q9 Det er lite respekt mellom forsker- eller faggruppene og administrasjonsavdelingen *

Involvering (Involvement)

Q10 Her lar lederne de ansatte medvirke i beslutninger som angår dem
Q11 Endringer blir gjort uten å snakke med de involverte *
Q12 De ansatte føler at beslutninger ofte tas uten at de blir hørt*

Støtte fra ledelsen (Supervisory Support)

Q13 Overordnede er dyktige til å forstå de ansattes problemer
Q14 Overordnede hos oss er vennlige og lette å henvende seg til
Q15 Overordnede viser forståelse for sine ansatte

Fokus på trening (Emphasis on Training)

Q16 De ansatte får ikke tilstrekkelig opplæring i nye systemer eller nytt utstyr*
Q17 Her gis det kun et minimum av den opplæringen de ansatte trenger for å gjøre jobben sin*
Q18 De ansatte får tilstrekkelig opplæring i å bruke nytt utstyr

Velferd (Welfare)

Q19 Her blir de ansatte tatt vare på
Q20 Her bryr man seg om de ansatte
Q21 Her prøver man å handle rettferdig overfor sine ansatte

Teamarbeid (Team)

Q22 Arbeidsgruppene her (komiteer, utvalg og råd, prosjektgrupper etc.) preges av god informasjonsdeling

Q23 Målene for arbeidsgruppene (komiteer, utvalg og råd, prosjektgrupper etc.) er godt kjent blant alle medlemmene

Q24 Arbeidsgruppene (komiteer, utvalg og råd, prosjektgrupper etc.) er preget av å være fleksible slik at man kan dele på oppgavene dersom det er behov for dette

Formalisering (Formalisation)

Q25 Hos oss blir det oppfattet som svært viktig å følge reglene

Q26 Hos oss må alt gjøres etter reglene

Q27 Hos oss blir ingen særlig opprørt hvis reglene brytes *

Tradisjon (Tradition)

Q28 Ledelsen foretrekker å holde seg til de etablerte, tradisjonelle måtene å gjøre ting på

Q29 Måten ting gjøres på her har aldri forandret seg særlig mye

Q30 Stolthet og lange tradisjoner er viktig hos oss

Innovasjon og Fleksibilitet (Innovation and Flexibility)

Q31 Behov for å gjøre ting annerledes fanges raskt opp av ledelsen

Q32 Her er vi fleksible; prosedyrer kan endres for å møte nye vilkår, og problemer løses når de oppstår

Q33 Det er lett å få støtte til utvikling av nye ideer

Utadrettet fokus Undervisning (Otward focus Teaching)

Q34 Her er vi ganske innadrettet; man bryr seg ikke om hva som skjer i de andre undervisningsinstitusjonene*

Q35 Det legges lite vekt på måter å bedre tilbudet til studentene*

Q36 Studentenes behov er ikke ansett som topp prioritet hos oss *

Utadrettet fokus Forskning (Outward focus research)

Q37 Her er man ganske innadrettet; man bryr seg ikke om hva som skjer ved forskningsfronten*

Q38 Det legges ikke mye vekt på måter å bedre kommunikasjonen med andre forskningsinstitusjoner *

Q39 Problemstillinger som preger den internasjonale forskningsfronten har ikke topp prioritet hos oss *

Utadrettet fokus Samfunn (Outward focus Society)

Q40 Her er vi ganske innadrettet; man bryr seg ikke om hva som skjer i samfunnet for øvrig*

Q41 Her legges det lite vekt på å bedre kommunikasjonen med samfunnet for øvrig*

Q42 Samfunnets behov er ikke ansett som topp prioritet hos oss*

Refleksivitet (Reflexivity)

Q43 Måten de ansatte jobber sammen på her endres gjerne hvis det bedrer prestasjonen
Q44 Målsetningene her endres i takt med forandringer i samfunnet
Q45 Man tar seg tid til å evaluere målsetningene her

Klarhet i organisasjonens mål (Clarity of organizational goal)

Q46 Organisasjonens fremtidige retning blir klart og tydelig kommunisert til alle
Q47 Alle som jobber her er bevisste på vår fremtidsplan og retning
Q48 Det finnes en klar oppfatning her angående hvilken retning vi går i

Effektivitet (Efficiency)

Q49 Ting kunne blitt gjort mer effektivt her hvis de ansatte tok seg tid til å tenke seg om*
Q50 Her resulterer dårlig planlegging ofte i at man ikke når sine målsetninger*
Q51 Produktiviteten kunne blitt forbedret her om arbeidet ble bedre organisert og planlagt*

Innsats (Effort)

Q52 Hos oss ønsker de ansatte alltid å prestere så godt de kan
Q53 De ansatte er entusiastiske i forhold til jobben sin
Q54 De ansatte er innstilt på å gjøre en ekstra innsats for å utføre en god jobb

Tilbakemelding på prestasjon (Performance Feedback)

Q55 De ansatte får som regel tilbakemelding i forhold til kvaliteten på det arbeidet de gjør
Q56 De ansatte har ingen anelse om hvorvidt de gjør en god jobb*
Q57 Måten de ansatte gjør jobben sin på blir sjelden evaluert*

Produksjonspress (Pressure to produce)

Q58 Det forventes for mye av de ansatte i løpet av en dag
Q59 Ledelsen krever at de ansatte jobber ekstremt hardt
Q60 De ansatte er under sterkt tidspress for å nå målsetninger

Kvalitet på Forskning (Quality Research)

Q61 Her forsøker vi alltid å oppnå de høyeste kvalitetsstandardene for forskning
Q62 Hos oss blir forskningskvalitet tatt seriøst
Q63 De ansattes oppfatning er at suksess avhenger av høy forskningskvalitet

Kvalitet på undervisning (Quality Teaching)

Q64 Her forsøker vi alltid å oppnå de høyeste kvalitetsstandardene for undervisning
Q65 Hos oss blir undervisningskvalitet tatt seriøst
Q66 De ansattes oppfatning et at suksess avhenger av høy kvalitet på undervisningen

Appendix B: NOCM_UH-R questionnaire. Distributed to administrative/technical employees.

Reversed items are marked with an asterix (*) and were reversed before all analyses were conducted.

Autonomi (Autonomy)

Q1 Lederne her lar stort sett ansatte ta sine egne beslutninger
Q2 Lederne her har tillit til at man kan ta arbeidsrelaterte beslutninger uten å innhente tillatelse først
Q3 Lederne her har et strengt regime over måten ting blir gjort på *

Integrasjon mellom administrative/tekniske ansatte (Integration among administrative/technical employees)

Q4 Det er lite konflikt innad i teknisk/administrativ avdeling (for eksempel mellom studieavdeling, IT, drift, personal)
Q5 De teknisk/administrativt ansatte er innstilt på å dele informasjon på tvers av teknisk/administrative enheter (for eksempel mellom studieavdeling, IT, drift , personal)
Q6 Det er lite respekt mellom noen av de teknisk/administrative enhetene her (for eksempel mellom studieavdeling, IT, drift, personal) *

Integrasjon mellom vitenskapelig- og administrativite/tekniske ansatte (Integration between scientific and administrativ/technical employees)

Q7 Det er lite konflikt mellom administrasjonsavdelingen og forsker/faggruppene her
Q8 De ansatte er innstilt på å dele informasjon på tvers av administrasjonsavdelingen og de faglige avdelinger her
Q9 Det er lite respekt mellom administrasjonsavdelingen og de faglige avdelingene her*

Involvering (Involvement)

Q10 Her lar lederne de ansatte medvirke i beslutninger som angår dem
Q11 Endringer blir gjort uten å snakke med de involverte *
Q12 De ansatte føler at beslutninger ofte tas uten at de blir hørt*

Støtte fra ledelsen (Supervisory Support)

Q13 Overordnede er dyktige til å forstå de ansattes problemer
Q14 Overordnede hos oss er vennlige og lette å henvende seg til
Q15 Overordnede viser forståelse for sine ansatte

Fokus på trening (Emphasis on Training)

Q16 De ansatte får ikke tilstrekkelig opplæring i nye systemer eller nytt utstyr*
Q17 Her gis det kun et minimum av den opplæringen de ansatte trenger for å gjøre jobben sin*
Q18 De ansatte får tilstrekkelig opplæring i å bruke nytt utstyr

Velferd (Welfare)

Q19 Her blir de ansatte tatt vare på
Q20 Her bryr man seg om de ansatte
Q21 Her prøver man å handle rettferdig overfor sine ansatte

Teamarbeid (Team)

Q22 Arbeidsgruppene her (komiteer, utvalg og råd, prosjektgrupper etc.) preges av god informasjonsdeling
Q23 Målene for arbeidsgruppene (komiteer, utvalg og råd, prosjektgrupper etc.) er godt kjent blant alle medlemmene
Q24 Arbeidsgruppene (komiteer, utvalg og råd, prosjektgrupper etc.) er preget av å være fleksible slik at man kan dele på oppgavene dersom det er behov for dette

Formalisering (Formalisation)

Q25 Hos oss blir det oppfattet som svært viktig å følge reglene
Q26 Hos oss må alt gjøres etter reglene
Q27 Hos oss blir ingen særlig opprørt hvis reglene brytes *

Tradisjon (Tradition)

Q28 Ledelsen foretrekker å holde seg til de etablerte, tradisjonelle måtene å gjøre ting på
Q29 Måten ting gjøres på her har aldri forandret seg særlig mye
Q30 Stolthet og lange tradisjoner er viktig hos oss

Innovasjon og Fleksibilitet (Innovation and Flexibility)

Q31 Behov for å gjøre ting annerledes fanges raskt opp av ledelsen
Q32 Her er vi fleksible; prosedyrer kan endres for å møte nye vilkår, og problemer løses når de oppstår
Q33 Det er lett å få støtte til utvikling av nye ideer

Utadrettet fokus Undervisning (Otward focus Teaching)

Q34 Her er vi ganske innadrettet; man bryr seg ikke om hva som skjer i de andre undervisningsinstitusjonene*
Q35 Det legges lite vekt på måter å bedre tilbudet til studentene*
Q36 Studentenes behov er ikke ansett som topp prioritet hos oss *

Utadrettet fokus Forskning (Outward focus research)

Q37 Administrasjonsavdelingen er ganske innadrettet; man bryr seg ikke om hva som skjer i eksterne forskningsfora *
Q38 I administrasjonsavdelingen legges det ikke mye vekt på måter å bedre kommunikasjonen med eksterne forskningsmiljøer *
Q39 Problemstillinger som preger den internasjonale forskningsfronten har ikke topp prioritet hos oss *

Utadrettet fokus Samfunn (Outward focus Society)

Q40 Administrasjonsavdelingen er ganske innadrettet; man bryr seg ikke om hva som skjer i samfunnet for øvrig *

Q41 Administrasjonsavdelingen legger ikke mye vekt på å bedre kommunikasjonen med samfunnet for øvrig *

Q42 Samfunnets behov er ikke ansett som topp prioritet hos administrasjonsavdelingen *

Refleksivitet (Reflexivity)

Q43 Måten de ansatte jobber sammen på her endres gjerne hvis det bedrer prestasjonen

Q44 Målsetningene her endres i takt med forandringer i samfunnet

Q45 Man tar seg tid til å evaluere målsetningene her

Klarhet i organisasjonens mål (Clarity of organizational goal)

Q46 Organisasjonens fremtidige retning blir klart og tydelig kommunisert til alle

Q47 Alle som jobber her er bevisste på vår fremtidsplan og retning

Q48 Det finnes en klar oppfatning her angående hvilken retning vi går i

Effektivitet (Efficiency)

Q49 Ting kunne blitt gjort mer effektivt her hvis de ansatte tok seg tid til å tenke seg om*

Q50 Her resulterer dårlig planlegging ofte i at man ikke når sine målsetninger*

Q51 Produktiviteten kunne blitt forbedret her om arbeidet ble bedre organisert og planlagt*

Innsats (Effort)

Q52 Hos oss ønsker de ansatte alltid å prestere så godt de kan

Q53 De ansatte er entusiastiske i forhold til jobben sin

Q54 De ansatte er innstilt på å gjøre en ekstra innsats for å utføre en god jobb

Tilbakemelding på prestasjon(Performance Feedback)

Q55 De ansatte får som regel tilbakemelding i forhold til kvaliteten på det arbeidet de gjør

Q56 De ansatte har ingen anelse om hvorvidt de gjør en god jobb*

Q57 Måten de ansatte gjør jobben sin på blir sjelden evaluert*

Produksjonspress (Pressure to produce)

Q58 Det forventes for mye av de ansatte i løpet av en dag

Q59 Ledelsen krever at de ansatte jobber ekstremt hardt

Q60 De ansatte er under sterkt tidspress for å nå målsetninger

Kvalitet på Forskning (Quality Research)

Q61 De teknisk/administrativt ansatte forsøker alltid å støtte forskerne slik at de kan oppnå de høyeste kvalitetsstandardene for forskning

Q62 I teknisk/administrativ avdeling blir støtte til forskningskvalitet tatt seriøst

Q63 De teknisk/administrative ansattes oppfatning er at suksess avhenger av teknisk/administrativ støtte for å oppnå forskningskvalitet

Kvalitet på undervisning (Quality Teaching)

Q64 De teknisk/administrativt ansatte forsøker alltid å oppnå de høyeste kvalitetsstandardene for undervisning

Q65 Blant de teknisk/administrativt ansatte blir undervisningskvalitet tatt seriøst

Q66 De teknisk/administrativt ansattes oppfatning er at suksess avhenger av høy kvalitet på undervisningen

Appendix C: Correlations matrix for NOCM_UH-R

Table A1

Scales	Mean	SD	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.
1. Autonomy	3.29	.66																					
2. Integration Within	3.04	.75	.24																				
3. Integration Between	2.91	.74	.16	.45																			
4. Involvement	2.93	.86	.37	.44	.34																		
5. Supervisory Support	3.23	.75	.41	.39	.33	.63																	
6. Traning	2.65	.89	.06	.25	.24	.33	.28																
7. Welfare	3.12	.81	.36	.48	.39	.67	.78	.35															
8. Team	2.61	.78	.14	.44	.40	.53	.47	.40	.48														
9. Formalization	2.70	.72	-.15	.16	.14	.06	.06	.05	.14	.18													
10. Tradition	2.27	.71	-.13	-.20	-.15	.22	-.15	-.20	-.17	-.16	.11												
11. Innovation & Flexibility	2.78	.76	.29	.41	.38	.58	.61	.36	.62	.50	.01	-.39											
12. Outward focus Teaching	3.13	.77	.20	.41	.30	.43	.38	.29	.46	.35	.14	-.29	.50										
13. Outward focus Research	2.94	.82	.13	.34	.29	.33	.29	.28	.33	.36	.12	-.25	.37	.47									
14. Outward focus Society	3.22	.77	.22	.31	.30	.41	.42	.27	.47	.35	.12	-.21	.47	.58	.56								
15. Reflexivity	2.70	.73	.14	.40	.34	.43	.43	.29	.49	.49	.15	-.23	.60	.53	.50	.58							
16. Clarity of org. goals	2.63	.83	.10	.35	.33	.44	.41	.28	.43	.47	.15	-.17	.46	.38	.42	.47	.58						
17. Efficiency	2.58	.77	.11	.31	.22	.30	.29	.25	.30	.34	.08	-.20	.36	.37	.35	.39	.38	.35					
18. Effort	3.33	.65	.22	.31	.26	.32	.36	.16	.36	.28	.12	-.13	.40	.44	.38	.47	.47	.37	.35				
19. Performance feedback	2.57	.83	.18	.38	.29	.48	.47	.32	.53	.44	.14	-.25	.53	.45	.34	.42	.54	.43	.36	.37			
20. Pressure to produce	2.39	.82	-.13	-.17	-.11	-.15	-.17	-.22	-.18	-.11	.06	.08	-.07	-.05	-.01	.04	-.03	-.09	-.04	.16	-.07		
21. Quality Research	2.97	.78	.14	.25	.26	.27	.26	.21	.30	.37	.19	-.13	.33	.31	.54	.34	.46	.37	.29	.43	.32	.00	
22. Quality Teaching	3.22	.72	.10	.30	.21	.28	.35	.17	.35	.30	.14	-.08	.38	.53	.31	.42	.49	.36	.29	.50	.35	.09	.41

N = 669

All correlations are statistically significant with $p<0.05$, except for those between Innovation & Flexibility and Formalization (p= 0.01), Pressure to produce and Outward focus research (p= -0.01), Pressure to produce and Efficiency (p= -0.04), Quality Research and Pressure to produce (p= 0.003)

Appendix D. Standard regression weights for scales and items in the NOCM_UH-R

Table A2

CVF quadrant	Dimension	Item	Estimate	Item	Estimate	Item	Estimate
HR	Autonomy	Q1	0.686	Q2	0.818	Q3	0.527
HR	Integration Within	Q4	0.578	Q5	0.723	Q6	0.694
HR	Integration Between	Q7	0.549	Q8	0.734	Q9	0.625
HR	Involvement	Q10	0.771	Q11	0.817	Q12	0.813
HR	Supervisory support	Q13	0.818	Q14	0.785	Q15	0.888
HR	Training	Q16	0.867	Q17	0.828	Q18	0.770
HR	Welfare	Q19	0.890	Q20	0.910	Q21	0.807
HR	Team	Q22	0.834	Q23	0.873	Q24	0.797
IP	Formalization	Q25	0.843	Q26	0.700	Q27	0.643
IP	Tradition	Q28	0.770	Q29	0.873	Q30	0.375
OS	Innovation & Flexibility	Q31	0.808	Q32	0.809	Q33	0.798
OS	Outwards focus Teaching	Q34	0.548	Q35	0.848	Q36	0.815
OS	Outwards focus Research	Q37	0.813	Q38	0.807	Q39	0.793
OS	Outwards focus Society	Q40	0.847	Q41	0.879	Q42	0.825
OS	Reflexivity	Q43	0.704	Q44	0.760	Q45	0.739
RG	Clarity of organizational goals	Q46	0.796	Q47	0.883	Q48	0.850
RG	Efficiency	Q49	0.618	Q50	0.872	Q51	0.703
RG	Effort	Q52	0.803	Q53	0.807	Q54	0.781
RG	Performance feedback	Q55	0.871	Q56	0.728	Q57	0.629
RG	Pressure to produce	Q58	0.717	Q59	0.811	Q60	0.770
RG	Quality Research	Q61	0.888	Q62	0.857	Q63	0.635
RG	Quality Teaching	Q64	0.853	Q65	0.886	Q66	0.676

HR= Human Relations model, IP= Internal Process model, OS= Open Systems model, RG= Rational Goal model